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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,724	12/11/2003	Noriaki Sakamoto	14225-033001 / F1030575US	9731
26211	7590	11/21/2006	EXAMINER	
FISH & RICHARDSON P.C. P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			ANDUJAR, LEONARDO	
			ART UNIT	PAPER NUMBER
			2826	

DATE MAILED: 11/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.		Applicant(s)	
	10/733,724		SAKAMOTO, NORIAKI	
	Examiner		Art Unit	
	Leonardo Andújar		2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 8/22/2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 8-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### **Acknowledgment**

1. The amendment filed on 08/22/2006 in response to the Office action mailed on 05/19/2006 has been entered. The present Office action is made with all the suggested amendments being fully considered. Accordingly, pending in this Office action are claims 1-18.

### ***Election/Restrictions***

2. Applicant's election without traverse of Group I (claims 1-7) in the reply filed on 04/17/2006 is acknowledged.

### ***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

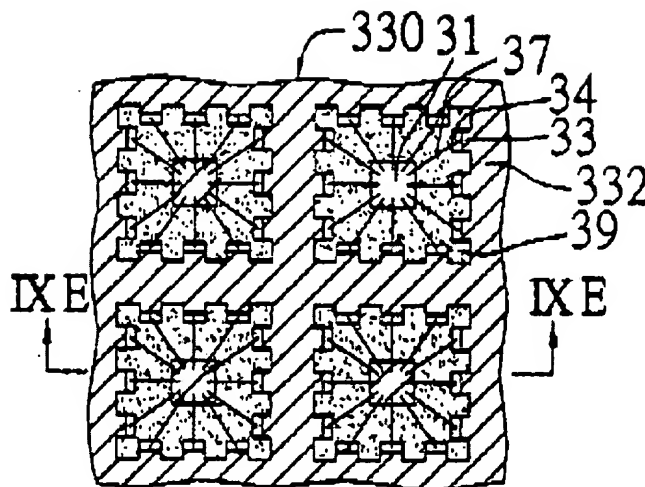
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fee et al. (US 2003/0164554) in view of Huang (US 6,630,729).

6. Regarding claim 1, Fee (e.g. fig. 2) shows a circuit device 10 comprising: conductive pattern (i.e. lead frame) circuit element 12, affixed onto the conductive

Fee does not disclose recessed areas located in the side surface of the insulating resin such that outwardly facing outer peripheral parts of the conductive pattern wherein the conductive pattern are exposed within the recessed areas. Nonetheless, Huang (e.g. fig. 10E) shows a circuit device having an insulating resin 39 having recessed areas located in the side surface of the resin such that outward facing outer peripheral parts of conductive patterns 33 wherein the conductive patterns are exposed within the recess areas. According to Huang, this embodiment allows the semiconductor packages to be stacked together in a manner that the package has its upper surface abutting a corresponding lower surface of an adjacent package, so as to increase the layout density and strengthen the performance for the packages (col. 3/lls. 25-32).

FIG. 10E



It would have been obvious to one having ordinary skill in the art at the time the invention was made to include recess at the side surface of the insulating resin disclosed by Fee such that outwardly facing outer peripheral parts of the conductive pattern and exposing the pattern within the recessed areas as suggested by Huang to allow the semiconductor packages to be stacked together in a manner that the package has its upper surface abutting a corresponding lower surface of an adjacent package, so as to increase the layout density and strengthen the performance for the packages

7. Regarding claim 2, Fee teaches that the circuit device is mounted by attaching brazing material (e.g. solder) to the exposed side surfaces and bottom surface of the conductive pattern (e.g. 0030).

8. Regarding claim 3, Fee teaches that the circuit element is a semiconductor element and the conductive pattern that is disposed at the peripheral part and the semiconductor element are electrically connected.

9. Regarding claim 4, Fee teaches that the conductive pattern comprises die pad 14 and bonding pad 18/20 and the circuit element is mounted on the die pad and the bonding pads are disposed so as to surround the die pad.

10. Regarding claim 6, Fee teaches that the covering resin is formed on the surface of the conductive pattern and the circuit element. Also, the conductive pattern are electrically connected via opening provided in the covering resin (see 0030)

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fee et al. (US 2003/0164554) in view of Huang (US 6,630,729) further in view of Jung et al. (US 2002/0056926).

12. Regarding claim 5, Fee in view of Huang shows most aspects of the instant invention except for plating on the rear surface and side surfaces of the conductive patterns that is exposed from the insulating resin. Nevertheless, Jung (e.g. fig. 2) shows a plating 250/254 can be provided on the exposed surfaces of the pads including the rear surface and side surface to protect them from contamination or corrosion (e.g. pp 00017 & 0034). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the invention disclosed by Fee in view of Hung including a plating on the rear surface and side surface of the conductive pattern that is exposed to prevent the pads from corrosion or contamination as taught by Jung.

13. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fee et al. (US 2003/0164554) in view of Huang (US 6,630,729) further in view of Koon et al. (US 6,836,009).

14. Regarding claim 6, Fee in view of Huang shows most aspects of the instant invention including a covering resin 26. Fee in view of Huang does not teach that the covering resin or encapsulant is made of a photosensitive material. Nevertheless, Koon teaches that photosensitive resins can be used to encapsulate devices (col. 10/lis. 65-66). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a photosensitive resin material as encapsulant in the device disclosed by Fee in view of Huang as suggested by Koon since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

#### ***Response to Arguments***

15. Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

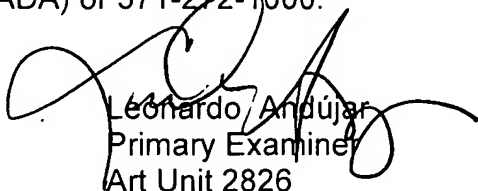
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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonardo Andújar whose telephone number is 571-272-1912. The examiner can normally be reached on Mon through Thu from 9:00 AM to 7:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Leonardo Andújar  
Primary Examiner  
Art Unit 2826



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